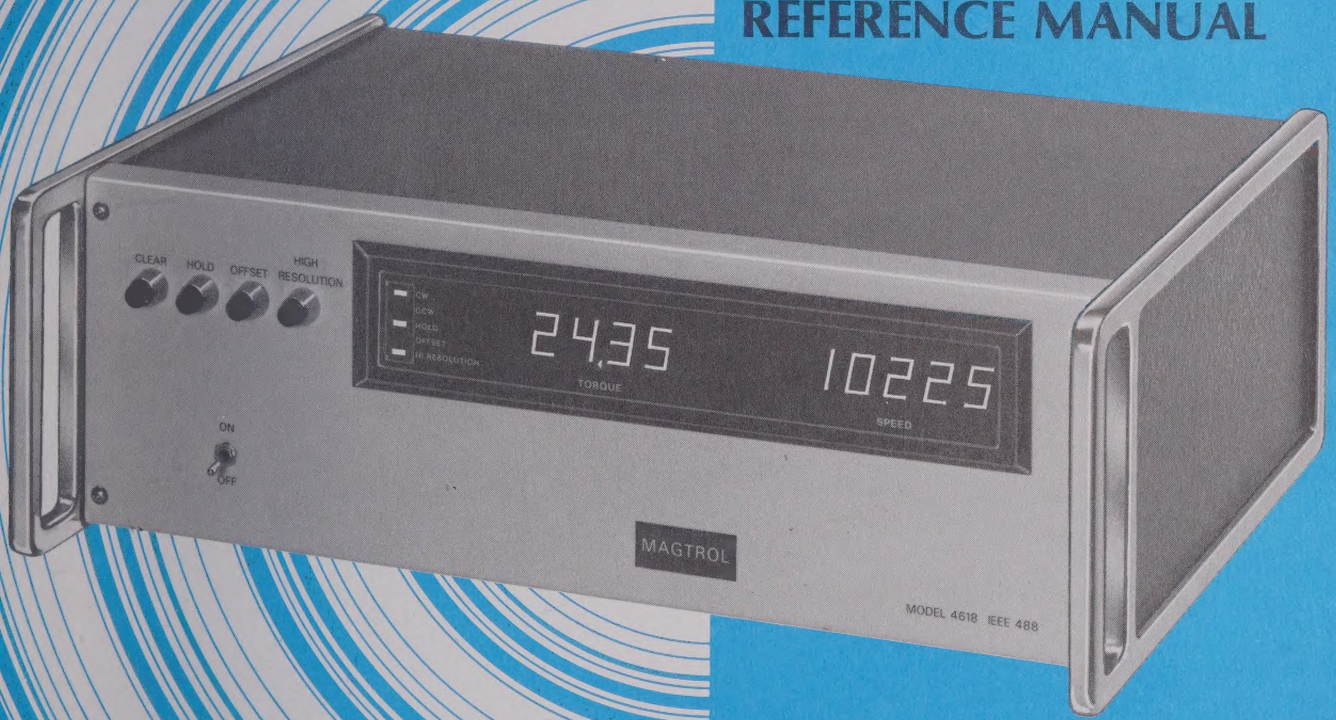
DYNAMOMETER READOUT

MODEL 4618

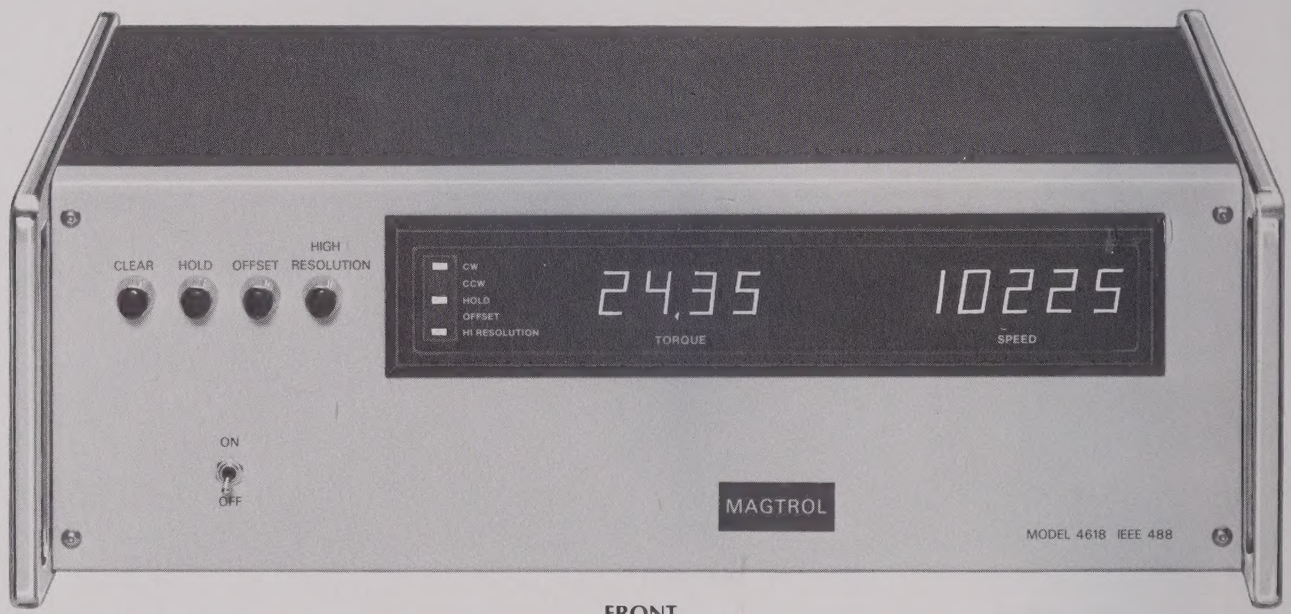
INSTRUCTION AND REFERENCE MANUAL



products for controlling
and measuring power

MAGTROL

MODEL 4618 DYNAMOMETER READOUT



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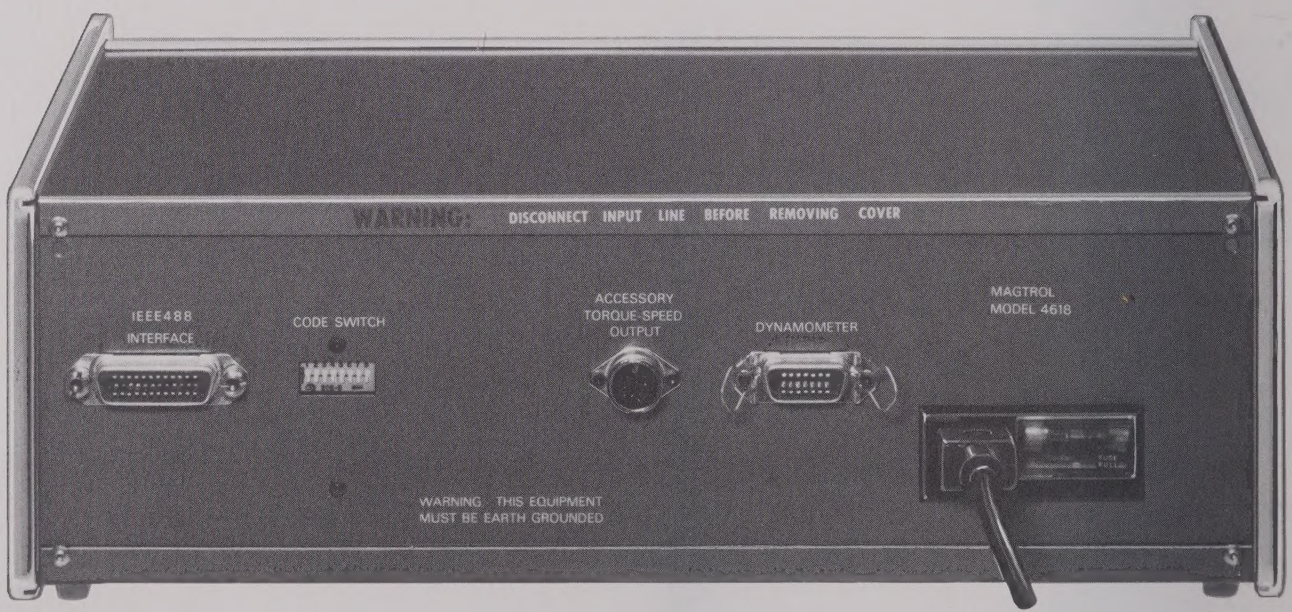

BACK

MAGTROL
DYNAMOMETER READOUT

MODEL 4618

INSTRUCTION AND REFERENCE MANUAL

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OPERATING INSTRUCTIONS

1.0 INTRODUCTION

1.1 UNPACKING All shipments leaving our plant are adequately packed and packaged. If there are signs of damage to this carton or its contents, please notify the shipper within 24 hours and retain carton and packing material for his examination.

1.2 POWER REQUIREMENTS Model 4618 is designed to operate from a single-phase, 50-60Hz AC power source of 120 or 240 volts. A special filtered AC power receptacle allows selection of proper line voltage for your location. The receptacle is a standard 3-pin connector, and a detachable 3-wire line cord is provided with the instrument. It is advisable to check for the correct voltage setting on the receptacle located on the instrument's rear panel. Check for the proper setting by visually verifying a 120 or 240 marking on the circuit card located on the right side of the receptacle housing. Model 4618 is factory-set for point-of-destination voltage requirements. This setting can be changed in the field if necessary; for information contact our customer service department.

The fuse receptacle contains a properly rated fuse for the instrument's point-of-destination power requirements.

CAUTION: THE LINE CORD ON THIS INSTRUMENT IS THE STANDARD (NATIONAL ELECTRICAL MANUFACTURERS ASSOCATION) THREE-WIRE GROUNDED LINE CORD. IT MUST CONNECT TO AN EARTH GROUND TO AVOID ELECTRICAL SHOCK HAZARD IN THE EVENT OF CERTAIN TEST-MOTOR DEFECTS.

2.0 OPERATION

This section describes the basic operation of Model 4618. It includes the proper AC requirements as well as a detailed explanation of all operating controls, modes of operation, and special features.

2.1 TURN-ON PROCEDURE

a. Check receptacle for correct line-voltage setting.
b. Check to see that the power switch on the front panel is in the OFF position.
c. Secure the 3-wire line cord to the rear-panel AC receptacle and plug the line cord into the AC outlet.
d. Turn the power switch to ON.
e. If the unit is operating correctly, the front-panel readouts will display lighted either CW or CCW; 0 torque; and 0 speed. If the display does not show these indications, turn the power switch to OFF and recheck section 1.2.

2.2 OPERATING CONTROLS, DISPLAYS, AND CONNECTORS

2.2.1 Front-Panel Controls

a. ON/OFF toggle power switch.
b. Pushbutton functions: CLEAR, HOLD, OFFSET, HI-RESOLUTION.

2.2.2 Front-Panel Displays

a. Vertical row of LEDs for pushbuttion selection verification and torque-application direction, indicating CW, CCW, HOLD, OFFSET, and HI-RESOLUTION.
b. TORQUE, four digits: SPEED, five digits.

2.2.3 Rear-Panel Connectors

a. 14-pin dynamometer cable receptacle.
b. 5-pin DIN receptacle supplying torque and speed outputs for accessories.
c. IEEE-488 connector for computer interface (code switch for IEEE-488 bus identification on rear panel). Shipped with default setting of 0.
d. AC power receptacle.

2.3 CONTROL SETUP Aside from the ON/OFF power switch, there are four pushbuttons controlling the clear, hold, offset, and high resolution functions. Hold, offset, and high resolution are selected by depressing their identified pushbuttons, and verified by their corresponding LEDs. They are cancelled by simultaneously depressing and releasing the function pushbutton and the CLEAR pushbutton. Cancellation is verified by the unlit condition of the LED function indicator.

3.0 FUNCTION DESCRIPTIONS

3.1 CLEAR is used only with the other function pushbuttons to cancel a previously selected operation.

3.2 HOLD causes the display to lock the torque and speed readings. When this function has been selected, no other function is operable.

3.3 OFFSET causes the torque display to read zero. Since dynamometer zero should preferably be set with a free shaft (nothing attached to it), Model 4618 has detection circuits that indicate a high offset by displaying HI-OFFS if the shaft is rotating, but it will complete the offset function and zero the display. This message is meant to remind the operator that a torque value error is now possible. If the shaft of the dynamometer is not rotating but the readout is displaying an excessive torque amount, the display will also show HI-OFFS, but it will not complete the offset function. (For proper zero set procedure, refer to digital dynamometer manual section 1.4.2.)

3.4 HIGH RESOLUTION expands the torque reading by a factor of 10, up to 1 part in 4000. Final resolution depends on the particular model of digital dynamometer; if the reading exceeds 1 part in 4000, for example over 40.00 on a dynamometer Model HD-400-6, the torque display will indicate HIGH and the unit will revert to normal (not high resolution) operation. To return to high resolution, you must reselect the function. The offset, high resolution, and clear functions can be computer-generated by an IEEE-4888 bus.

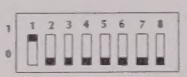
4.0 IEEE-488 (HPIB)

This Model 4618 feature connects the torque, speed, and motor-direction data to a computer for data-acquisition purposes. It also allows computer control of the offset, high resolution, and clear functions, which is accomplished by using the industry standard interface, commonly known as the 488 bus (IEEE-488/1978) or the GPIB (general-purpose interface bus). The bus is also known by other names, two of which are HPIB (Hewlett Packard interface bus) and ASCII bus.

4.1 IEEE-488 MECHANICAL ELECTRICAL CONNECTOR mates with standard 24-conductor IEEE-488 cables. IEEE-488 connections are confined within the following limits:

a. No more than fifteen devices may be connected in a single IEEE-488 bus system.
b. The total length of cable used in the IEEE-488 bus system must not exceed twenty meters.
c. The total length of cable must also not exceed two meters times the number of devices in the system.

4.2 IEEE-488 ADDRESS SWITCH SETTING Each device on the IEEE-488 must have a different address. The address for the 4618/IEEE-488 is preset to 0 at the factory. A five-segment switch on the instrument's rear panel is used to assign the Model 4618 address. The ON position of each segment corresponds to binary 1 and the OFF position corresponds to binary 0. There are thirty-one (0 through 30) possible addresses; they are shown in the following table.



Switch Segment					Address
1 LSB	2	3	4	5 MSB	
0	0	0	0	0	0
1	0	0	0	0	1
0	1	0	0	0	2
1	1	0	0	0	3
0	0	1	0	0	4
1	0	1	0	0	5
0	1	1	0	0	6
1	1	1	0	0	7
0	0	0	1	0	8
1	0	0	1	0	9
0	1	0	1	0	10
1	1	0	1	0	11
0	0	1	1	0	12
1	0	1	1	0	13
0	1	1	1	0	14
1	1	1	1	0	15
0	0	0	0	1	16
1	0	0	0	1	17
0	1	0	0	1	18
1	1	0	0	1	19
0	0	1	0	1	20
1	0	1	0	1	21
0	1	1	0	1	22
1	1	1	0	1	23
0	0	0	1	1	24
1	0	0	1	1	25
0	1	0	1	1	26
1	1	0	1	1	27
0	0	1	1	1	28
1	0	1	1	1	29
0	1	1	1	1	30

4.3 OPERATION WITH SYSTEM CONTROLLER DATA ACQUISITION The data are in the form of a 19-character string consisting of torque, speed, and shaft-direction information. To acquire these data, the necessary statement is

ENTER 700; A$

A$ is now torque, speed, and shaft-direction information. Any time this statement is used, this information appears on the bus. Torque is in a four-digit format and speed in a five-digit format; direction is CW or CCW.

FUNCTION SELECTION To select any of the four available functions (offset, high resolution, clear high resolution, clear offset), the following statement is necessary:

OUTPUT 700; A, B, Q, or R

(A = offset, B = high resolution, Q = clear high resolution, R = clear offset.)

This causes the instrument to come under computer control for function selection, superseding manual control. Whether in manual or computer control, a reset statement will return the instrument to the refresh state.

OPERATIONAL EXAMPLE

Step 1	10 DIM A$ (19)	dimensions the string at 19 characters
Step 2	20 OUTPUT 700; A B	sets up offset and high resolution
Step 3	30 ENTER 700; A$	enters torque, speed, and direction data
Step 4	40 DISP A$	displays torque, speed, and direction data
Step 5	50 GO TO 30	repeats steps 3 and 4

5.0 OPERATIONAL TECHNICAL DESCRIPTION

The load cell, speed transducer, and associated electronics are described in the dynamometer instruction manual. The interconnection of these elements to the Model 4618 readout is by the 14-pin connector shown in the next paragraph.

5.1 DYNAMOMETER CONNECTOR The electrical function and voltage level of each connector pin is as follows:

PIN NO.	VOLTAGE LEVEL PIN TO CHASSIS	FUNCTION
1	+25 ±5VDC	AMPLIFIER POSITIVE SUPPLY
2	0	COMMON
3	+25 ±5VDC	LOAD CELL POSITIVE SUPPLY
4	0	COMMON
5	+12 ±2VDC	AMPLIFIER NEGATIVE SUPPLY
6	−15 ±.5VDC	AMPLIFIER NEGATIVE SUPPLY
7	+5.0 ±.5VDC	EXCITER LAMP SUPPLY
8	0	EXCITER LAMP COMMON
9	0 or +5V	DECIMAL POINT LOCATOR
10	+.2 to +1.2VDC	SPEED SIGNAL INPUT
11	+10 ±1VDC	P.E. CELL SUPPLY
12	0 to +5V	DECIMAL POINT LOCATOR
13	COMMON	TORQUE SIGNAL COMMON
14	0 to ±1.5	TORQUE SIGNAL

This connector is serviced from the power supply PC board PSB-1. The torque and speed signals interconnect from connector pins 10 and 14 through a ribbon connector to the conversion PC board.

6.0 REAR PANEL OUTPUTS

Three signal outputs for speed, torque, and IEEE-488 are provided on the rear panel.

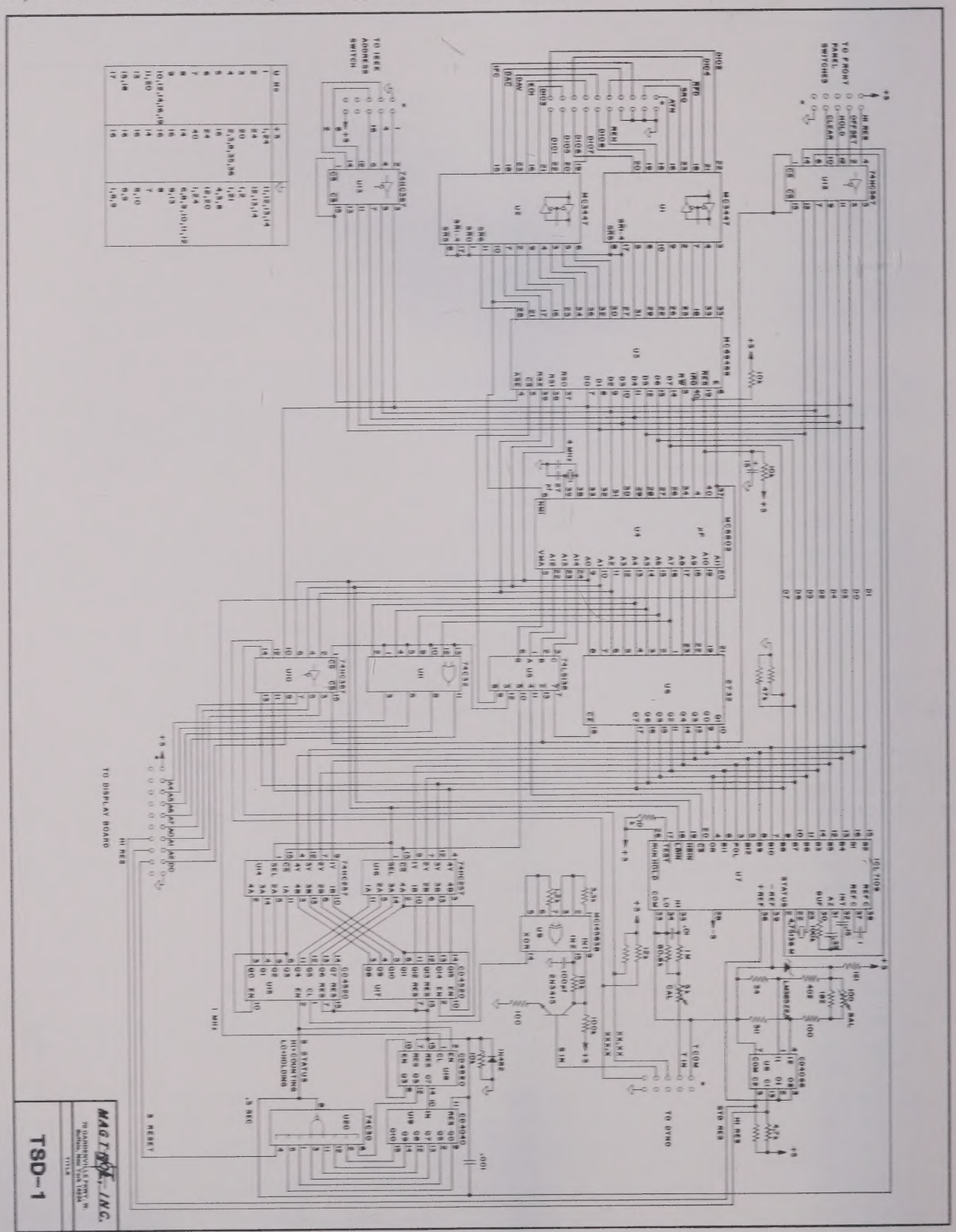
6.1 SPEED The DIN connector provides a buffered pulse output of 60 pulses per dynamometer shaft revolution across pins 1 and 2. This is a TTL-compatible signal with a maximum (level 0) sinking current of 1.0 milliamps for logic zero of <.5 VDC.

6.2 TORQUE The DIN connector provides this signal output across pins 3 and 4. The polarity of the signal is dependent upon the direction of the test motor shaft. It is an analog voltage, close to zero impedance, at a maximum current of 3 milliamps. The voltage level depends on the dynamometer being used and its torque units. It is equal to the whole number in millivolts of the digital torque readout, ignoring any decimal point. Thus a readout of 123.4 oz.in. indicates a voltage level of 1,234 millivolts, or 1.234 VDC (±1%).

6.3 IEEE-488 This industry standard connector provides all necessary signals for operation of an IEEE-488/1978 bus.

7.0 SCHEMATIC DIAGRAMS

For your convenience, schematics by section appear on the following pages.


TSD-1
MAG TECH INC.
TO DISPLAY BOARD
TO FRONT PANEL SWITCHES
TO IEEE ADDRESS SWITCH
TO DYNO
HI RES
LO RES
MC3447
MC68488
MC68B09
MC68B03
74LS109
74HC367
74HC157
74HC257
74HC374
74LS138
74HC4040
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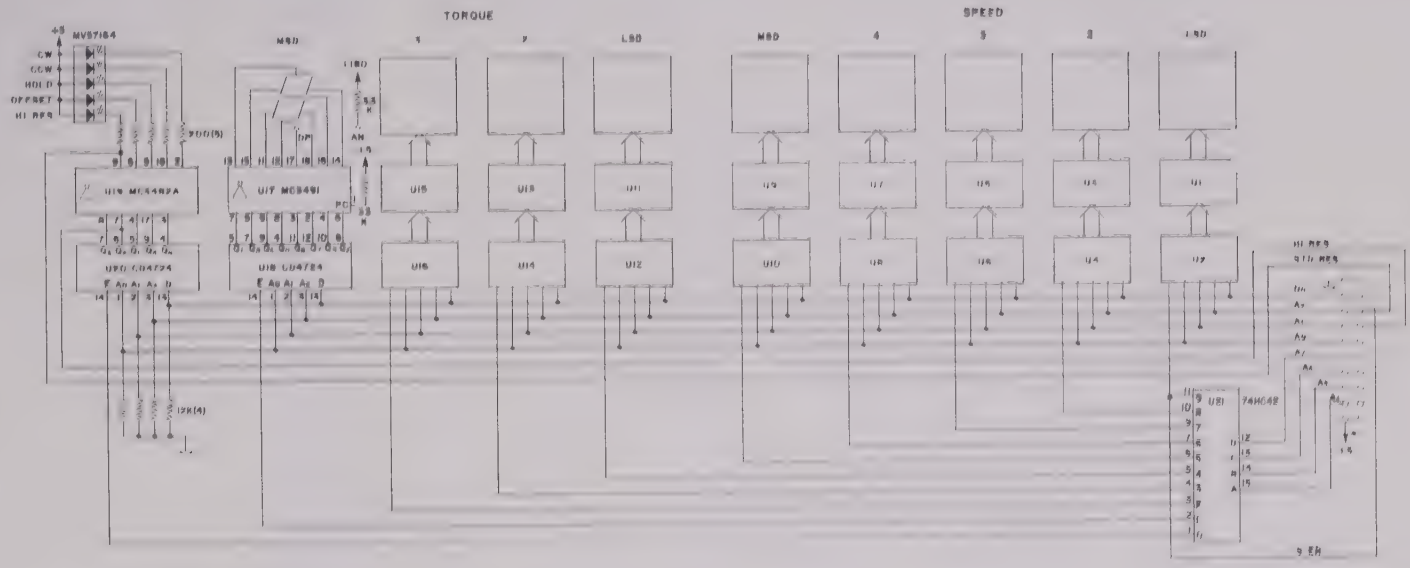

U No.	1-5	...
1,3,5,7,9, 11,13,15,17		10
19	11,13,14,18, 20	1,10
2,4,6,8,10, 12,14,16,18, 20	16	8,15
21	14	7

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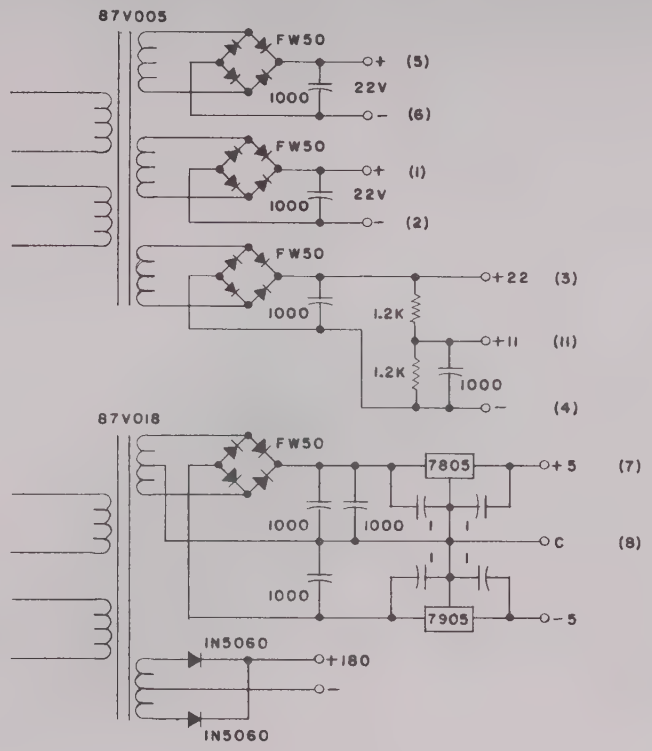
DRO-3



NO./ASSY	MATERIAL SPEC;	L	W	H	DIA
SCALE	TOLERANCES: FRACT. – ± 1/64 .XXX – ± .005 .XX – ± .010" ANG. – ± 1/2 DEG.		SURFACE FINISH MICROINCHES		
	DRAWN	CHECKED	APPROVED	TITLE: PSB-1	
DATE BY				NEXT ASS'Y	DWG. NO.

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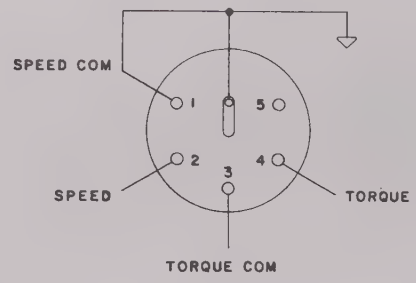
70 GARDENVILLE PKWY. W.
Buffalo, New York 14224

LETTER	DATE	BY	ENG'R. CHG. NO	CHANGE

REVISIONS



NO./ASSY	MATERIAL SPEC;	L	W	H	DIA
SCALE	TOLERANCES: FRACT. – ± 1/64 .XXX – ± .005 .XX – ± .010" ANG. – ± 1/2 DEG.		SURFACE FINISH MICROINCHES		
	DRAWN	CHECKED	APPROVED	TITLE: DIN-1	
DATE BY				NEXT ASS'Y	DWG. NO.

MAGTROL, INC.
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Buffalo, New York 14224

LETTER	DATE	BY	ENG'R. CHG. NO.	CHANGE

REVISIONS

MAGTROL LIMITED WARRANTY

This Magtrol product is warranted against defects in materials and workmanship for ninety (90) days from the date of delivery. We will repair or replace products which prove to be defective during the warranty period provided they are returned to Magtrol. Additionally, any repairs which may become necessary beyond the ninety (90) day warranty period will be made subject to review by our quality control department. No other warranty is expressed or implied. We are not liable for consequential damages.

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* * * * * *

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